CLAIMS

1. A method for optical imaging of retinal function comprising:

an illuminating observing step of illuminating the retinal region of the rear surface of an eyeball including the macular area and the optic disk with an invisible light and observing the retinal region;

a stimulating step of illuminating the retinal region with a visible flash light to stimulate a retinal function including an optic disk's function;

an imaging step of capturing images A, B before and after the stimulation of the retinal region illuminated with the invisible light; and

a calculating step of detecting the change of the retinal function of the retinal region from the images A, B before and after the stimulation,

wherein, in the calculating step, the images A, B before and after the stimulation are registered in advance and the change of the retinal function is displayed with an image from the registered images.

2. The method for optical imaging of retinal function according to claim 1, wherein, in the registering, the image B after the stimulation is subjected to translation, rotation, enlargement or any other linear operation or nonlinear image transformation, the image B' subjected to the linear operation or image transformation is compared with the image A by using an appropriate

evaluation function to acquire an optimal image B' registered to the image A.

3. The method for optical imaging of retinal function according to claim 2, wherein the registering is performed by calculating a correlation coefficient γ between the overlapping regions of the two images A and B' or between the corresponding pixel values xi and yi (i is a positive integer) of the feature points by using the expression (1) of [Eq. 1] in order to achieve a transformation that provides the correlation coefficient closest to 1.

[Eq. 1]

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2} \sqrt{\sum (y_i - \bar{y})^2}} \quad \cdots(1)$$

4. The method for optical imaging of retinal function according to claim 2, wherein the image display is performed by calculating a fraction a/b where a and b are the brightness of the image A and the brightness of the image B', respectively, or the difference between them Δ=a-b for each corresponding pixel from the image A before the stimulation and the optimal registered image B' after the stimulation and associating the fraction or the difference with the pixel position on the display.

5. The method for optical imaging of retinal function according to claim 1, wherein:

the visible flash light is a single or flickering light having a wavelength greater than or equal to 470 nm

and less than or equal to 780 nm; and

the invisible light is an infrared light having a wavelength greater than or equal to 800 nm and less than 1000 nm.

6. An apparatus for optical imaging of retinal function comprising:

a stimulator for illuminating the retinal region of the rear surface of an eyeball including the macular area with a visible flash light to stimulate a retinal function including an optic disk's function;

an illuminator for illuminating the retinal region with an invisible light;

an imaging device for capturing images A, B before and after the stimulation of the retinal region illuminated with the invisible light; and

a calculator for detecting the change of the retinal function of the retinal region from the images A, B before and after the stimulation,

wherein the calculator has an image processing program for registering the images A, B before and after the stimulation in advance and subsequently displaying the retinal function with an image from the registered images by using a computer.

7. The apparatus for optical imaging of retinal function according to claim 6, wherein:

the stimulator is a flash device for emitting a visible flash light having a wavelength greater than or

equal to 470 nm and less than or equal to 780 nm in the form of a single or flickering light; and

the illuminator is an infrared light emitting device for continuously emitting an infrared light having a wavelength greater than or equal to 800 nm and less than 1000 nm.

8. The apparatus for optical imaging of retinal function according to claim 7, further comprising a fixation point forming device for forming a fixation point that can be fixed by an examinee on the retina.

9. The apparatus for optical imaging of retinal function according to claim 8, further comprising an optical filter for selectively dimming a reflected light from the vicinity of the optic disk to capture the images of the macular area without saturation particularly when imaging the function of the retina only.